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<input type="checkbox"/>	L9	l4 not L7	2
<input type="checkbox"/>	L8	L7 not l6	2
<input type="checkbox"/>	L7	L4 and (muta\$ or variant)	16
<input type="checkbox"/>	L6	L5 and l4	14
<input type="checkbox"/>	L5	glycosidase with (muta\$ or variant)	158
<input type="checkbox"/>	L4	glycosidase with nucleophile	18
<input type="checkbox"/>	L3	L2 and (muta\$ or variant)	151
<input type="checkbox"/>	L2	glycosidase and nucleophile	229
<input type="checkbox"/>	L1	glycosidase and glycosynthase	13

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Search Results - Record(s) 1 through 10 of 13 returned.

☐ 1. Document ID: US 20040142856 A1

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L1: Entry 1 of 13

File: PGPB

Jul 22, 2004

PGPUB-DOCUMENT-NUMBER: 20040142856  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040142856 A1

TITLE: Glycoconjugation methods and proteins/peptides produced by the methods

PUBLICATION-DATE: July 22, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	
Hakes, David	Willow Grove	PA	US	
Chen, Xi	Lansdale	PA	US	

US-CL-CURRENT: 514/8; 435/68.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 2. Document ID: US 20040137557 A1

L1: Entry 2 of 13

File: PGPB

Jul 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040137557  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040137557 A1

TITLE: Remodeling and glycoconjugation of peptides

PUBLICATION-DATE: July 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	

Bayer, Robert	San Diego	CA	US
Bowe, Caryn	Doylestown	PA	US
Hakes, David	Willow Grove	PA	US
Chen, Xi	Lansdale	PA	US

US-CL-CURRENT: 435/68.1; 530/322

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWAC	Draw D
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☐ 3. Document ID: US 20040132640 A1

L1: Entry 3 of 13

File: PGPB

Jul 8, 2004

PGPUB-DOCUMENT-NUMBER: 20040132640  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040132640 A1

TITLE: Glycopegylation methods and proteins/peptides produced by the methods

PUBLICATION-DATE: July 8, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	
Hakes, David	Willow Grove	PA	US	
Chen, Xi	Lansdale	PA	US	

US-CL-CURRENT: 514/8; 530/395

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWAC	Draw D
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☐ 4. Document ID: US 20040126838 A1

L1: Entry 4 of 13

File: PGPB

Jul 1, 2004

PGPUB-DOCUMENT-NUMBER: 20040126838  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040126838 A1

TITLE: Follicle stimulating hormone: remodeling and glycoconjugation of FSH

PUBLICATION-DATE: July 1, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	

Zopf, David	Wayne	PA	US
Bayer, Robert	San Diego	CA	US
Bowe, Caryn	Doylestown	PA	US
Hakes, David	Willow Grove	PA	US
Chen, Xi	Lansdale	PA	US

US-CL-CURRENT: 435/68.1; 530/397

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw. De
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☐ 5. Document ID: US 20040115168 A1

L1: Entry 5 of 13

File: PGPB

Jun 17, 2004

PGPUB-DOCUMENT-NUMBER: 20040115168  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040115168 A1

TITLE: Interferon beta: remodeling and glycoconjugation of interferon beta

PUBLICATION-DATE: June 17, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	
Hakes, David	Willow Grove	PA	US	
Chen, Xi	Lansdale	PA	US	

US-CL-CURRENT: 424/85.6; 435/68.1, 530/351

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw. De
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☐ 6. Document ID: US 20040096465 A1

L1: Entry 6 of 13

File: PGPB

May 20, 2004

PGPUB-DOCUMENT-NUMBER: 20040096465  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040096465 A1

TITLE: Novel receptors for \$1(helicobater pyroli) and use thereof

PUBLICATION-DATE: May 20, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
------	------	-------	---------	---------

Miller-Podraza, Halina	Hind?aring;s	US
Teneberg, Susann	Goteb?ouml;rg	SE
Angstrom, Jonas	G?ouml;teborg	SE
Karlsson, Karl-Anders	Vantaa	SE
Natunen, Jari		SE

US-CL-CURRENT: 424/234.1; 514/54, 536/53

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 7. Document ID: US 20040091977 A1

L1: Entry 7 of 13

File: PGPB

May 13, 2004

PGPUB-DOCUMENT-NUMBER: 20040091977  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040091977 A1

TITLE: Mehtod for the modification of polymeric carbohydrate materials

PUBLICATION-DATE: May 13, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Teeri, Tuula Tellervo	Taby		SE	
Brumer III, Harry	Johanneshov		SE	

US-CL-CURRENT: 435/101; 536/56

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 8. Document ID: US 20040082026 A1

L1: Entry 8 of 13

File: PGPB

Apr 29, 2004

PGPUB-DOCUMENT-NUMBER: 20040082026  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040082026 A1

TITLE: Interferon alpha: remodeling and glycoconjugation of interferon alpha

PUBLICATION-DATE: April 29, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	

Hakes, David	Willow Grove	PA	US
Chen, Xi	Lansdale	PA	US

US-CL-CURRENT: 435/68.1; 530/351

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 9. Document ID: US 20040077836 A1

L1: Entry 9 of 13

File: PGPB

Apr 22, 2004

PGPUB-DOCUMENT-NUMBER: 20040077836  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040077836 A1

TITLE: Granulocyte colony stimulating factor: remodeling and glycoconjugation of G-CSF

PUBLICATION-DATE: April 22, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	
Hakes, David	Willow Grove	PA	US	
Chen, Xi	Lansdale	PA	US	

US-CL-CURRENT: 530/351; 435/68.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 10. Document ID: US 20040063911 A1

L1: Entry 10 of 13

File: PGPB

Apr 1, 2004

PGPUB-DOCUMENT-NUMBER: 20040063911  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040063911 A1

TITLE: Protein remodeling methods and proteins/peptides produced by the methods

PUBLICATION-DATE: April 1, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	

Hakes, David	Willow Grove	PA	US
Chen, Xi	Lansdale	PA	US

US-CL-CURRENT: 530/351; 435/68.1, 530/395

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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Terms	Documents
glycosidase and glycosynthase	13

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☐ 11. Document ID: US 20040043446 A1

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L1: Entry 11 of 13

File: PGPB

Mar 4, 2004

PGPUB-DOCUMENT-NUMBER: 20040043446  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040043446 A1

TITLE: Alpha galactosidase a: remodeling and glycoconjugation of alpha galactosidase A

PUBLICATION-DATE: March 4, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DeFrees, Shawn	North Wales	PA	US	
Zopf, David	Wayne	PA	US	
Bayer, Robert	San Diego	CA	US	
Bowe, Caryn	Doylestown	PA	US	
Hakes, David	Willow Grove	PA	US	
Chen, Xi	Lansdale	PA	US	

US-CL-CURRENT: [435/68.1](#); [435/193](#), [435/208](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 12. Document ID: US 20030138880 A1

L1: Entry 12 of 13

File: PGPB

Jul 24, 2003

PGPUB-DOCUMENT-NUMBER: 20030138880  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030138880 A1

TITLE: Solid-phase synthesis of oligosaccharides and glycopeptides using glycosynthases

PUBLICATION-DATE: July 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
------	------	-------	---------	---------



Withers, Stephen G.	Vancouver	CA
Jensen, Knud J.	Copenhagen	DK
Petersen, Lars	Copenhagen	DK
Tolborg, Jakob L.	Ballerup	DK

US-CL-CURRENT: 435/68.1; 435/101, 435/85

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWAC	Draw D
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☐ 13. Document ID: WO 3018605 A2

L1: Entry 13 of 13

File: EPAB

Mar 6, 2003

PUB-NO: WO003018605A2

DOCUMENT-IDENTIFIER: WO 3018605 A2

TITLE: SOLID-PHASE SYNTHESIS OF OLIGOSACCHARIDES AND GLYCOPEPTIDES USING  
GLYCOSYNTASES

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWAC	Draw D
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Terms	Documents
glycosidase and glycosynthase	13

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- ☐ 1. [20040142856](#). 09 Apr 03. 22 Jul 04. Glycoconjugation methods and proteins/peptides produced by the methods. DeFrees, Shawn, et al. 514/8; 435/68.1 A61K038/16 C12P021/06.
- ☐ 2. [20040137557](#). 05 Nov 02. 15 Jul 04. Remodeling and glycoconjugation of peptides. DeFrees, Shawn, et al. 435/68.1; 530/322 A61K038/16 C12P021/06 C07K009/00.
- ☐ 3. [20040132640](#). 09 Apr 03. 08 Jul 04. Glycopegylation methods and proteins/peptides produced by the methods. DeFrees, Shawn, et al. 514/8; 530/395 A61K038/16 C07K014/00 C07K001/113.
- ☐ 4. [20040126838](#). 09 Apr 03. 01 Jul 04. Follicle stimulating hormone: remodeling and glycoconjugation of FSH. DeFrees, Shawn, et al. 435/68.1; 530/397 C12Q001/68 C12P021/06.
- ☐ 5. [20040115168](#). 09 Apr 03. 17 Jun 04. Interferon beta: remodeling and glycoconjugation of interferon beta. DeFrees, Shawn, et al. 424/85.6; 435/68.1 530/351 C12P021/06 A61K038/21.
- ☐ 6. [20040096951](#). 17 Nov 03. 20 May 04. Crystal structures of retaining glycosyltransferases. Withers, Stephen G., et al. 435/193; 435/87 536/53 C12P019/38 C12N009/10 C08B037/00.
- ☐ 7. [20040091977](#). 09 Oct 03. 13 May 04. Method for the modification of polymeric carbohydrate materials. Teeri, Tuula Tellervo, et al. 435/101; 536/56 C08B001/00 C12P019/04.
- ☐ 8. [20040082026](#). 09 Apr 03. 29 Apr 04. Interferon alpha: remodeling and glycoconjugation of interferon alpha. DeFrees, Shawn, et al. 435/68.1; 530/351 C12P021/06 C07K014/54.
- ☐ 9. [20040077836](#). 09 Apr 03. 22 Apr 04. Granulocyte colony stimulating factor: remodeling and glycoconjugation of G-CSF. DeFrees, Shawn, et al. 530/351; 435/68.1 C12P021/06 C07K014/535.
- ☐ 10. [20040063911](#). 09 Apr 03. 01 Apr 04. Protein remodeling methods and proteins/peptides produced by the methods. DeFrees, Shawn, et al. 530/351; 435/68.1 530/395 C12P021/06 C07K014/54.

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Terms	Documents
glycosidase with nucleophile	18

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- ☐ 11. [20040043446](#). 09 Apr 03. 04 Mar 04. Alpha galactosidase a: remodeling and glycoconjugation of alpha galactosidase A. DeFrees, Shawn, et al. 435/68.1; 435/193 435/208 C12P021/06 C12N009/40 C12N009/10.
- ☐ 12. [20030199072](#). 14 Nov 02. 23 Oct 03. Crystal and structure of a thermostable glycosol hydrolase and use thereof, and modified proteins. Crennell, Susan J., et al. 435/200; 702/19 G06F019/00 G01N033/48 G01N033/50 G01N031/00 C12N009/24.
- ☐ 13. [20030138880](#). 26 Aug 02. 24 Jul 03. Solid-phase synthesis of oligosaccharides and glycopeptides using glycosynthases. Withers, Stephen G., et al. 435/68.1; 435/101 435/85 C12P021/06 C12P019/28 C12P019/04.
- ☐ 14. [20030100749](#). 17 Apr 01. 29 May 03. Methods and compositions for synthesis of oligosaccharides using mutant glycosidase enzymes. Withers, Stephen G., et al. 536/123.1; 435/100 435/101 435/201 536/123.13 C07H003/04 C07H003/06 C12P019/12 C12P019/04 C12N009/26 C12N009/24.
- ☐ 15. [6506592](#). 18 Aug 99; 14 Jan 03. Hyperthermophilic alpha-glucosidase gene and its use. Blum; Paul. 435/262; 435/183 435/195 435/200 435/204 435/205 435/207 435/208 435/267 435/274. C07C003/00 C07G017/00 C12N009/00 C12N009/14.
- ☐ 16. [5716812](#). 12 Dec 95; 10 Feb 98. Methods and compositions for synthesis of oligosaccharides, and the products formed thereby. Withers; Stephen G., et al. 435/74; 435/100 435/200 435/201 435/209 536/4.1. C12P019/44 C12P019/12 C12N015/00 C12N009/24.
- ☐ 17. [EP000359399A1](#). 14 Aug 89. 21 Mar 90. Process for the enzymatic production of dipeptides.. AASMUL-OLSEN, STIG, et al. 435/135. C07K001/00; C12P021/02.
- ☐ 18. [EP 870037B](#). Mutant form of glycosidase enzyme for oligosaccharide synthesis - has catalytically active carboxylic acid-containing amino acids, used in the preparation of oligosaccharide (s). MACKENZIE, L, et al. C07H003/04 C07H003/06 C07H015/18 C07H015/203 C07H017/02 C07H017/04 C07H017/075 C07K019/00 C12N009/24 C12N009/26 C12N009/42 C12N015/00 C12N015/09 C12N015/56 C12N015/62 C12P019/04 C12P019/12 C12P019/14 C12P019/44.

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Terms	Documents
glycosidase with nucleophile	18

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STN Express with Discover!  
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NEWS EXPRESS OCTOBER 29 CURRENT WINDOWS VERSION IS V7.01A, CURRENT  
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=> s glycosidase and nucleophile  
L1 696 GLYCOSIDASE AND NUCLEOPHILE

=> s glycosidase (10a) nucleophile  
L2 179 GLYCOSIDASE (10A) NUCLEOPHILE

=> s l2 (10a)(muta? or variant)  
10 FILES SEARCHED...  
L3 52 L2 (10A)(MUTA? OR VARIANT)

=> dup rem l3  
PROCESSING COMPLETED FOR L3  
L4 15 DUP REM L3 (37 DUPLICATES REMOVED)

=> d 1-10

L4 ANSWER 1 OF 15 MEDLINE on STN DUPLICATE 1  
AN 2004496603 IN-PROCESS  
DN PubMed ID: 15252054  
TI Directed evolution of a glycosynthase from Agrobacterium sp. increases its  
catalytic activity dramatically and expands its substrate repertoire.  
AU Kim Young-Wan; Lee Seung Seo; Warren R Antony J; Withers Stephen G  
CS Protein Engineering Network of Centres of Excellence of Canada, British  
Columbia, Canada.  
SO Journal of biological chemistry, (2004 Oct 8) 279 (41) 42787-93.  
Journal code: 2985121R. ISSN: 0021-9258.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS IN-PROCESS; NONINDEXED; Priority Journals  
ED Entered STN: 20041007  
Last updated on STN: 20041020

L4 ANSWER 2 OF 15 MEDLINE on STN DUPLICATE 2  
AN 2004039182 MEDLINE  
DN PubMed ID: 14740034  
TI Thioglycosynthases: double mutant glycosidases that serve as scaffolds for  
thioglycoside synthesis.  
AU Jahn Michael; Chen Hongming; Mullegger Johannes; Marles Jennifer; Warren R  
Antony J; Withers Stephen G  
CS Department of Chemistry, University of British Columbia, 2036 Main Mall,  
Vancouver, B.C. V6T 1Z1, Canada.  
SO Chemical communications (Cambridge, England), (2004 Feb 7) (3) 274-5.  
Journal code: 9610838. ISSN: 1359-7345.  
CY England: United Kingdom  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200405  
ED Entered STN: 20040124  
Last updated on STN: 20040510

Entered Medline: 20040507

L4 ANSWER 3 OF 15 MEDLINE on STN DUPLICATE 3  
AN 2003361724 MEDLINE  
DN PubMed ID: 12859194  
TI Activity of hyperthermophilic glycosynthases is significantly enhanced at acidic pH.  
AU Perugino Giuseppe; Trincone Antonio; Giordano Assunta; van der Oost John; Kaper Thijs; Rossi Mose; Moracci Marco  
CS Institute of Protein Biochemistry-Consiglio Nazionale delle Ricerche, via P. Castellino 111, 80131, Naples Italy.  
SO Biochemistry, (2003 Jul 22) 42 (28) 8484-93.  
Journal code: 0370623. ISSN: 0006-2960.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200310  
ED Entered STN: 20030805  
Last Updated on STN: 20031008  
Entered Medline: 20031006

L4 ANSWER 4 OF 15 MEDLINE on STN DUPLICATE 4  
AN 2002453162 MEDLINE  
DN PubMed ID: 12210988  
TI Specificity studies of bacillus 1,3-1,4-beta-glucanases and application to glycosynthase-catalyzed transglycosylation.  
AU Fairweather Jon K; Faijes Magda; Driguez Hugues; Planas Antoni  
CS Centre de Recherche sur les Macromolecules Vegetales, CNRS, Universite J. Fourier, BP 53, 38041 Grenoble Cedex 9, France.  
SO Chembiochem : a European journal of chemical biology, (2002 Sep 2) 3 (9) 866-73.  
Journal code: 100937360. ISSN: 1439-4227.  
CY Germany: Germany, Federal Republic of  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200307  
ED Entered STN: 20020906  
Last Updated on STN: 20030715  
Entered Medline: 20030714

L4 ANSWER 5 OF 15 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2002:420325 HCAPLUS  
DN 137:169701  
TI Glycosynthases: new tools for oligosaccharide synthesis  
AU Jakeman, David L.; Withers, Stephen G.  
CS Department of Chemistry, University of British Columbia, Vancouver, BC, V6T 1Z1, Can.  
SO Trends in Glycoscience and Glycotechnology (2002), 14(75), 13-25  
CODEN: TGGLEE; ISSN: 0915-7352  
PB FCCA  
DT Journal; General Review  
LA English/Japanese  
RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 6 OF 15 SCISEARCH COPYRIGHT (c) 2004 The Thomson Corporation. on STN DUPLICATE 5  
AN 2002:473145 SCISEARCH  
GA The Genuine Article (R) Number: 558CQ  
TI Glycosynthases: Mutant glycosidases for glycoside synthesis  
AU Williams S J; Withers S G (Reprint)  
CS Univ British Columbia, Dept Chem, 2036 Main Mall, Vancouver, BC V6T 1Z1, Canada (Reprint); Univ British Columbia, Dept Chem, Vancouver, BC V6T 1Z1, Canada  
CYA Canada  
SO AUSTRALIAN JOURNAL OF CHEMISTRY, (MAY 2002) Vol. 55, No. 1-2, pp. 3-12.  
Publisher: C S I R O PUBLISHING, 150 OXFORD ST, PO BOX 1139, COLLINGWOOD, VICTORIA 3066, AUSTRALIA.  
ISSN: 0004-9425.  
DT General Review; Journal  
LA English  
REC Reference Count: 43  
\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L4 ANSWER 7 OF 15 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2002:209028 HCAPLUS  
DN 137:136711  
TI Engineering glycosidases for constructive purposes  
AU Jakeman, David L.; Withers, Stephen G.  
CS Department of Chemistry, Protein Engineering Network of Centres of  
Excellence, University of British Columbia, Vancouver, Can.  
SO Special Publication - Royal Society of Chemistry (2002), 275(Carbohydrate  
Bioengineering), 3-8  
CODEN: SROCD0; ISSN: 0260-6291  
PB Royal Society of Chemistry  
DT Journal; General Review  
LA English  
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 15 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on  
STN  
AN 2001:567023 BIOSIS  
DN PREV200100567023  
TI New approaches to enzymatic oligosaccharide synthesis: Glycosynthases.  
AU Withers, Stephen G. [Reprint author]  
CS Department of Chemistry, University of British Columbia, Vancouver, BC,  
V6T 1Z1, Canada  
SO Glycobiology, (October, 2001) Vol. 11, No. 10, pp. 934. print.  
Meeting Info.: 6th Annual Conference of the Society for Glycobiology. San  
Francisco, California, USA. November 14-17, 2001.  
ISSN: 0959-6658.  
DT Conference; (Meeting)  
Conference; Abstract; (Meeting Abstract)  
LA English  
ED Entered STN: 12 Dec 2001  
Last Updated on STN: 25 Feb 2002

L4 ANSWER 9 OF 15 MEDLINE on STN DUPLICATE 6  
AN 2001690422 MEDLINE  
DN PubMed ID: 11738173  
TI Dissection of nucleophilic and acid-base catalysis in glycosidases.  
AU Zechel D L; Withers S G  
CS Protein Engineering Network of Centres of Excellence of Canada and  
Department of Chemistry, University of British Columbia, Vancouver,  
Canada.  
SO Current opinion in chemical biology, (2001 Dec) 5 (6) 643-9. Ref: 33  
Journal code: 9811312. ISSN: 1367-5931.  
CY England: United Kingdom  
DT Journal; Article; (JOURNAL ARTICLE)  
General Review; (REVIEW)  
(REVIEW, TUTORIAL)  
LA English  
FS Priority Journals  
EM 200202  
ED Entered STN: 20011213  
Last Updated on STN: 20020206  
Entered Medline: 20020205

L4 ANSWER 10 OF 15 MEDLINE on STN DUPLICATE 7  
AN 2001267758 MEDLINE  
DN PubMed ID: 11358691  
TI Directed evolution of new glycosynthases from Agrobacterium  
beta-glucosidase: a general screen to detect enzymes for oligosaccharide  
synthesis.  
AU Mayer C; Jakeman D L; Mah M; Karjala G; Gal L; Warren R A; Withers S G  
CS Protein Engineering Network of Centres of Excellence of Canada, Department  
of Chemistry, University of British Columbia, Vancouver.  
SO Chemistry & biology, (2001 May) 8 (5) 437-43.  
Journal code: 9500160. ISSN: 1074-5521.  
CY England: United Kingdom  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200109  
ED Entered STN: 20010917  
Last Updated on STN: 20010917  
Entered Medline: 20010913

=> d 9, 10 ab

L4 ANSWER 9 OF 15 MEDLINE on STN DUPLICATE 6  
AB A startling array of added anions have been observed to function as replacement catalytic \*\*\*nucleophiles\*\*\* in \*\*\*mutant\*\*\* \*\*\*glycosidases\*\*\*, including formate, azide, fluoride and other halides. Likewise, the mechanism of acid-base catalysis is somewhat plastic. The carboxylic acids can be substituted by a sulfenic acid or by ascorbate, and the effective acid strength enhanced by the introduction of strong hydrogen bonds. These studies provide an interesting bridge between enzymes and models thereof.

L4 ANSWER 10 OF 15 MEDLINE on STN DUPLICATE 7  
AB BACKGROUND: Oligosaccharide synthesis is becoming increasingly important to industry as diverse therapeutic roles for these molecules are discovered. The chemical synthesis of oligosaccharides on an industrial scale is often prohibitively complex and costly. An alternative, that of enzymatic synthesis, is limited by the difficulty of obtaining an appropriate enzyme. A general screen for enzymes that catalyze the synthesis of the glycosidic bond would enable the identification and engineering of new or improved enzymes. RESULTS: Glycosynthases are \*\*\*nucleophile\*\*\* \*\*\*mutants\*\*\* of retaining \*\*\*glycosidases\*\*\* that efficiently catalyze the synthesis of the glycosidic linkage by condensing an activated glycosyl fluoride donor with a suitable acceptor sugar. A novel agar plate-based coupled-enzyme screen was developed (using a two-plasmid system) and used to select an improved glycosynthase from a library of mutants. CONCLUSIONS: Plate-based coupled-enzyme screens of this type are extremely valuable for identification of functional synthetic enzymes and can be applied to the evolution of a range of glycosyl transferases.

=> d 11-15

L4 ANSWER 11 OF 15 MEDLINE on STN DUPLICATE 8  
AN 2000176961 MEDLINE  
DN PubMed ID: 10714501  
TI A novel thermophilic glycosynthase that effects branching glycosylation.  
AU Trincone A; Perugino G; Rossi M; Moracci M  
CS Istituto per la Chimica di Molecole di Interesse Biologico, C.N.R., Naples, Italy.. atrincone@icmib.na.cnr.it  
SO Bioorganic & medicinal chemistry letters, (2000 Feb 21) 10 (4) 365-8. Journal code: 9107377. ISSN: 0960-894X.  
CY ENGLAND: United Kingdom  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200005  
ED Entered STN: 20000525  
Last Updated on STN: 20000525  
Entered Medline: 20000515

L4 ANSWER 12 OF 15 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2000:327102 HCAPLUS  
TI Turbo-glycosynthases: Enhanced glycosylation activity obtained by substituting serine at the nucleophile position in retaining glycosidases.  
AU Zechel, David L.; Mayer, Christoph; Nashiru, Oyekanmi; Reid, Stephen P.; Warren, R. Antony J.; Withers, Stephen G.  
CS Department of Chemistry, University of British Columbia, Vancouver, BC, V6T 1Z1, Can.  
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March 26-30, 2000 (2000), BIOL-061 Publisher: American Chemical Society, Washington, D. C. CODEN: 69CLAC  
DT Conference; Meeting Abstract  
LA English

L4 ANSWER 13 OF 15 MEDLINE on STN DUPLICATE 9  
AN 2000115459 MEDLINE  
DN PubMed ID: 10648808  
TI The E358S mutant of Agrobacterium sp. beta-glucosidase is a greatly improved glycosynthase.  
AU Mayer C; Zechel D L; Reid S P; Warren R A; Withers S G  
CS Protein Engineering Network of Centres of Excellence, Department of Chemistry, University of British Columbia, Vancouver, B.C., Canada.  
SO FEBS letters, (2000 Jan 21) 466 (1) 40-4.



Journal code: 0155157. ISSN: 0014-5793.  
CY Netherlands  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200002  
ED Entered STN: 20000309  
Last Updated on STN: 20000309  
Entered Medline: 20000222

L4 ANSWER 14 OF 15 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on  
STN  
AN 2000:122871 BIOSIS  
DN PREV200000122871  
TI The E358S mutant of Agrobacterium sp. beta-glucosidase is a greatly  
improved glycosynthase.  
AU Mayer, Christoph; Zeche, David L.; Reid, Stephen P.; Warren, R. Antony  
J.; Withers, Stephen G. [Reprint author]  
CS Protein Engineering Network of Centres of Excellence, Department of  
Chemistry, University of British Columbia, Vancouver, B.C., V6T 1Z1,  
Canada  
SO FEBS Letters, (Jan. 21, 2000) vol. 469, No. 1, pp. 40-44. print.  
CODEN: FEBLAL. ISSN: 0014-5793.  
DT Article  
LA English  
ED Entered STN: 5 Apr 2000  
Last Updated on STN: 3 Jan 2002

L4 ANSWER 15 OF 15 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 1998:716686 HCAPLUS  
DN 130:77826  
TI Restoration of the Activity of Active-Site Mutants of the  
Hyperthermophilic .beta.-Glycosidase from Sulfolobus solfataricus:  
Dependence of the Mechanism on the Action of External Nucleophiles  
AU Moracci, Marco; Trincione, Antonio; Perugini, Giuseppe; Ciaramella, Maria;  
Rossi, Mose  
CS Institute of Protein Biochemistry and Enzymology, Consiglio Nazionale  
delle Ricerche, Naples, 80125, Italy  
SO Biochemistry (1998), 37(49), 17262-17270  
CODEN: BICHAW; ISSN: 0006-2960  
PB American Chemical Society  
DT Journal  
LA English  
RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> dis his

(FILE 'HOME' ENTERED AT 22:26:50 ON 10 NOV 2004)

FILE 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS,  
NTIS, ESBIODBASE, BIOTECHNO, WPIDS' ENTERED AT 22:27:08 ON 10 NOV 2004

L1 696 S GLYCOSIDASE AND NUCLEOPHILE  
L2 179 S GLYCOSIDASE (10A) NUCLEOPHILE  
L3 52 S L2 (10A)(MUTA? OR VARIANT)  
L4 15 DUP REM L3 (37 DUPLICATES REMOVED)

=> log h

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

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30.99

SESSION WILL BE HELD FOR 60 MINUTES

STN INTERNATIONAL SESSION SUSPENDED AT 22:34:20 ON 10 NOV 2004